

WHAT IS CLAIMED IS:

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1 ~~1. An apparatus for downhole testing, from the surface, of at least one~~
2 ~~control line adjacent a downhole tool assembly comprising:~~
3 ~~at least one tubular housing connectable to the downhole tool assem-~~
4 ~~bly, said housing comprising at least one exterior connection connected to at least~~
5 ~~one control line which extends toward the downhole tool assembly~~
6 ~~a running tool defining a wall and connectable to said tubular housing~~
7 ~~to allow said tubular housing with said control line and the downhole tool assembly~~
8 ~~to be run to a desired location downhole, said running tool in fluid communication~~
9 ~~with said exterior connection through an opening in said wall so as to allow a~~
10 ~~pressure test at said desired location through said running tool of said at least one~~
11 ~~control line which extends from said exterior connection.~~

1 2. The apparatus of claim 1, wherein:
2 said running tool further comprises a valve which, in a closed position,
3 facilitates pressurization of said at least one control line and, in an open position,
4 allows pressure to be transmitted through said housing to operate the downhole tool
5 assembly.

1 3. The apparatus of claim 2, wherein:
2 said running tool is sealingly engaged to said housing.

1 4. The apparatus of claim 3, wherein:
2 said running tool is releasably engaged to said housing.

1 5. The apparatus of claim 1, wherein:

2 said at least one exterior connection comprises one half of a male
3 female push in connection, said running tool comprising the other half of said male
4 female connection whereupon makeup of said male female connection, the interior
5 or said running tool is in fluid communication with said control line through said at
6 least one connection.

1 6. The apparatus of claim 5, further comprising:
2 an upper housing having the same portion of said male female con-
3 nection as said running tool, said upper housing insertable downhole after removal
4 of said running tool, said upper housing connected to a control line segment which
5 extends from the surface to the portion of the male female connection on said upper
6 housing, whereupon makeup of said male female connection said control line
7 extends from the surface past said tubular housing and toward the downhole tool
8 assembly.

1 7. The apparatus of claim 6, wherein:
2 said upper housing and said tubular housing comprise an alignment
3 device to insure proper orientation of said male and female components of each
4 said connection before they can be pushed together downhole.

1 8. The apparatus of claim 7, further comprising:
2 a locking mechanism which engages after insertion of said male into
3 said female component of each said connection to selectively hold them together.

1 9. The apparatus of claim 8, wherein:
2 said upper housing is selectively, releasably, sealingly locked to said
3 tubular housing.

1 10. The apparatus of claim 1, further comprising:
2 at least two exterior connections on said tubular housing, said at least
3 one control line extending from one of said exterior connections to or through at
4 least part of the downhole tool assembly and terminating at another exterior con-
5 nection on said tubular housing, whereupon said running tool in fluid communication
6 with said exterior connections can pressure test the U-shaped portion of said at
7 least one control line between said exterior connections.

1 11. The apparatus of claim 10, further comprising:
2 at least one upper housing comprising at least one pair of control lines
3 connected to it which extend from the surface, said upper housing insertable
4 downhole after removal of said running tool to connect said at least one pair of
5 control lines respectively to said at least two exterior connections on said tubular
6 housing downhole so as to provide at least one continuous control line from the
7 surface beyond said tubular housing and back to the surface.

1 12. The apparatus of claim 11, further comprising:
2 at least two tubular housings spaced from each other and assembled
3 to the downhole tool assembly;
4 a plurality of pairs of control lines connected from said surface to said
5 upper housing and extending to different locations downhole by a connection on at
6 least one of said tubular housings.

1 13. The apparatus of claim 1, further comprising:
2 an upper housing having at least one control line connected to it which
3 extends from the surface, and terminates in an exterior connection, said upper

4 housing insertable downhole after removal of said running tool, whereupon said
5 exterior connections of said tubular housing and said upper housing sealingly
6 engage downhole to extend said at least one control line from the surface past said
7 tubular housing and toward the downhole tool assembly.

1 14. The apparatus of claim 13, further comprising:
2 at least one signal transmitting cable disposed in said control line
3 extending from the surface to beyond said tubular housing.

1 15. The apparatus of claim 14, wherein:
2 said upper housing comprises at least a pair of control lines extending
3 from the surface and terminating at at least a pair of external connections on said
4 upper housing;
5 said tubular housing comprising at least one pair of exterior connec-
6 tions between which extends a control line forming a generally U-shape and
7 extending downward toward the downhole tool assembly;
8 said cable comprises a fiber optic cable extending from the surface
9 through said control line downhole and back to the surface.

1 16. The method of testing at least one control line downhole comprising:
2 connecting a tubular housing to a downhole tool assembly, said
3 tubular housing having at least one external control line and at least one connection
4 for said control line;
5 connecting a running tool to said tubular housing;
6 providing fluid communication through said running tool into said
7 control line;

8 connecting tubing to said running tool;
9 running in said running tool on said tubing;
10 pressure testing the control line extending downhole from said tubular
11 housing through said running tool.

1 17. The method of claim 16, further comprising:
2 opening a valve in said running tool after said pressure testing;
3 operating a portion of the downhole tool assembly through said
4 running tool.

1 18. The method of claim 16, further comprising:
2 removing the running tool;
3 connecting at least one upper control line with an end connection to
4 an upper housing;
5 running in said upper housing and upper control line on tubing;
6 joining downhole said end connection on said upper control line to
7 said connection on said tubular housing.

1 19. The method of claim 18, further comprising:
2 extending a signal cable from the surface through said upper control
3 line and into said control line, extending from the tubular housing and toward the
4 downhole tool assembly.

1 20. The method of claim 19, further comprising:
2 providing at least one pair of upper control lines each ending in an end
3 connection externally to said upper housing;

4 providing said control line on said tubular body in a generally U-shape
5 with at least a pair of connections on said tubular housing;

6 providing an alignment feature between said housings so as to align
7 connections between them;

8 moving said housings together to selectively sealingly secure said
9 aligned connections;

10 running at least one fiber optic cable as said signal cable from the
11 surface, down through one said upper control line, past said tubular housing
12 through the control line connected to it, and back to the surface through another
13 said upper control line on said upper body.

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